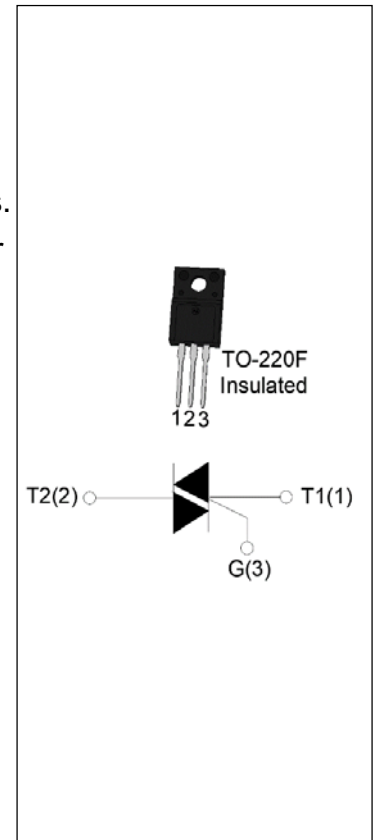


**JST12F-600CW 12A TRIAC**

Rev.A.1.0

**DESCRIPTION:**

The JST12F-600CW triac is suitable for general purpose AC switching. It can be used as an ON/OFF function in applications such as heating regulation, induction motor starting circuits, for phase control operation in light dimmers, motor speed controllers. JST12F-600CW snubberless triac is especially recommended for use on inductive loads. By using an external plastic package, JST12F-600CW provides a rated insulation voltage of 2000 VRMS, complying with UL standards (File ref: E252906). Package TO-220F is RoHS compliant.


**MAIN FEATURES**

| Symbol             | Value    | Unit |
|--------------------|----------|------|
| $I_{T(RMS)}$       | 12       | A    |
| $V_{DRM}/V_{RRM}$  | 600      | V    |
| $I_{GT\ I/II/III}$ | 35/35/35 | mA   |

**ABSOLUTE MAXIMUM RATINGS**

| Parameter  | Symbol       | Value   | Unit                   |
|--|--------------|---------|------------------------|
| Storage junction temperature range   | $T_{stg}$    | -40-150 | °C                     |
| Operating junction temperature range   | $T_j$        | -40-125 | °C                     |
| Repetitive peak off-state voltage ( $T_j=25^\circ\text{C}$ )   | $V_{DRM}$    | 600     | V                      |
| Repetitive peak reverse voltage ( $T_j=25^\circ\text{C}$ )   | $V_{RRM}$    | 600     | V                      |
| RMS on-state current ( $T_c \leq 85^\circ\text{C}$ )   | $I_{T(RMS)}$ | 12      | A                      |
| Non repetitive surge peak on-state current (full cycle, $t_p=20\text{ms}$ , $T_j=25^\circ\text{C}$ )             | $I_{TSM}$    | 120     | A                      |
| Non repetitive surge peak on-state current (full cycle, $t_p=16.6\text{ms}$ , $T_j=25^\circ\text{C}$ )           |              | 132     |                        |
| $I^2t$ value for fusing ( $t_p=10\text{ms}$ , $T_j=25^\circ\text{C}$ )   | $I^2t$       | 72      | $\text{A}^2\text{s}$   |
| Critical rate of rise of on-state current ( $I_G=2 \times I_{GT}$ , $f=100\text{Hz}$ , $T_j=125^\circ\text{C}$ ) | $di/dt$      | 100     | $\text{A}/\mu\text{s}$ |
| Peak gate current ( $t_p=20\mu\text{s}$ , $T_j=125^\circ\text{C}$ )  | $I_{GM}$     | 4       | A                      |
| Average gate power dissipation ( $T_j=125^\circ\text{C}$ )   | $P_{G(AV)}$  | 0.5     | W                      |

|   |          |     |    |
|---|----------|-----|----|
| Peak gate power   | $P_{GM}$ | 10  | W  |
| Peak pulse voltage<br>( $T_j=25^{\circ}C$ ; non-repetitive, off-state; FIG.7) | $V_{pp}$ | 4.5 | kV |

**ELECTRICAL CHARACTERISTICS** ( $T_j=25^{\circ}C$  unless otherwise specified)

| Symbol               | Test Condition  | Quadrant    | Value |      | Unit       |
|----------------------|---|-------------|-------|------|------------|
| $I_{GT}$             | $V_D=12V R_L=33\Omega$                                | I - II -III | MAX.  | 35   | mA         |
| $V_{GT}$             |   | I - II -III | MAX.  | 1    | V          |
| $V_{GD}$             | $V_D=V_{DRM} T_j=125^{\circ}C$<br>$R_L=3.3K\Omega$    | I - II -III | MIN.  | 0.2  | V          |
| $I_L$                | $I_G=1.2I_{GT}$                                       | I -III      | MAX.  | 50   | mA         |
|                      |   | II          |       | 60   |            |
| $I_H$                | $I_T=500mA$   |             | MAX.  | 35   | mA         |
| dV/dt                | $V_D=400V$ Gate Open $T_j=125^{\circ}C$               |             | MIN.  | 1000 | V/ $\mu s$ |
| (dI/dt) <sub>c</sub> | (dV/dt) <sub>c</sub> =20V/ $\mu s$ $T_j=125^{\circ}C$ |             | MIN.  | 10   | A/ms       |
| $t_{on}$             | $I_G=40mA I_A=200mA I_R=20mA$<br>$T_j=25^{\circ}C$    |             | TYP.  | 3    | $\mu s$    |
| $t_{off}$            |   |             |       | 30   |            |

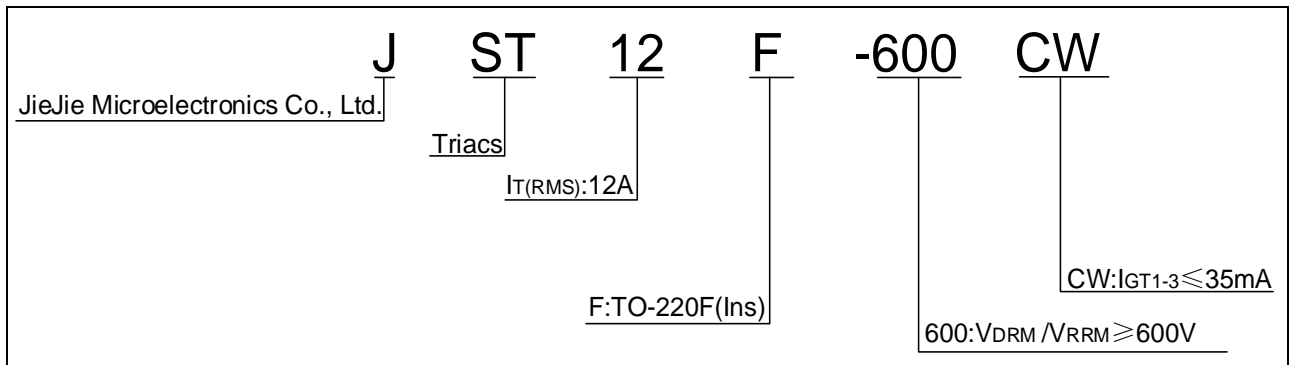
**STATIC CHARACTERISTICS**

| Symbol    | Parameter                 |                    | Value(MAX.) | Unit       |
|-----------|---------------------------|--------------------|-------------|------------|
| $V_{TM}$  | $I_{TM}=17A t_p=380\mu s$ | $T_j=25^{\circ}C$  | 1.5         | V          |
| $V_{TO}$  | Threshold voltage         | $T_j=125^{\circ}C$ | 0.77        | V          |
| $R_D$     | Dynamic resistance        | $T_j=125^{\circ}C$ | 35          | m $\Omega$ |
| $I_{DRM}$ | $V_D=V_{DRM} V_R=V_{RRM}$ | $T_j=25^{\circ}C$  | 5           | $\mu A$    |
| $I_{RRM}$ |                           | $T_j=125^{\circ}C$ | 0.4         | mA         |

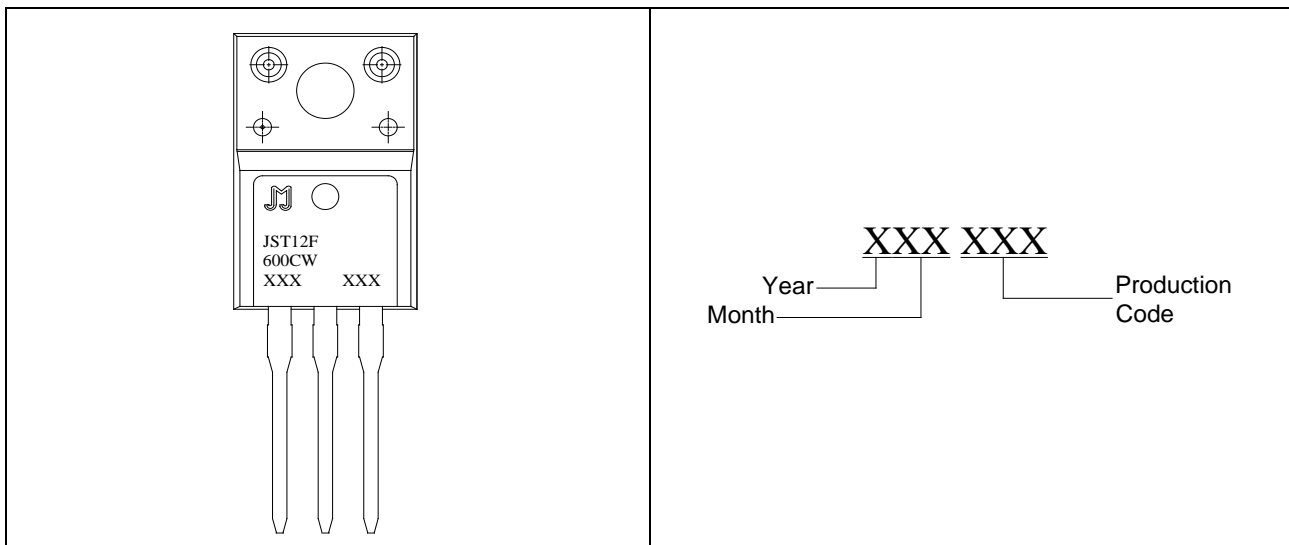
**THERMAL RESISTANCES**

| Symbol        | Parameter                | Value | Unit          |
|---------------|--------------------------|-------|---------------|
| $R_{th(j-c)}$ | junction to case (AC)    | 2.4   | $^{\circ}C/W$ |
| $R_{th(j-a)}$ | junction to ambient (AC) | 60    | $^{\circ}C/W$ |

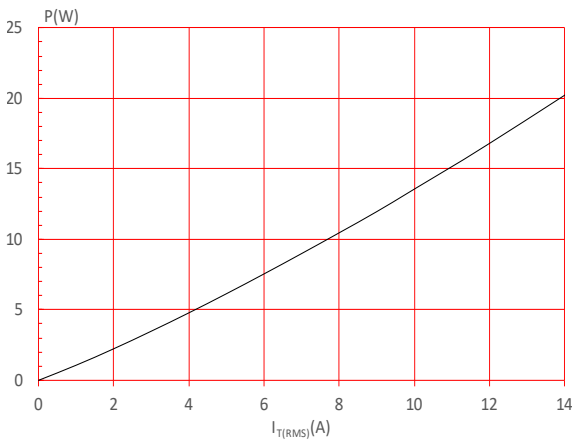
**ORDERING INFORMATION**



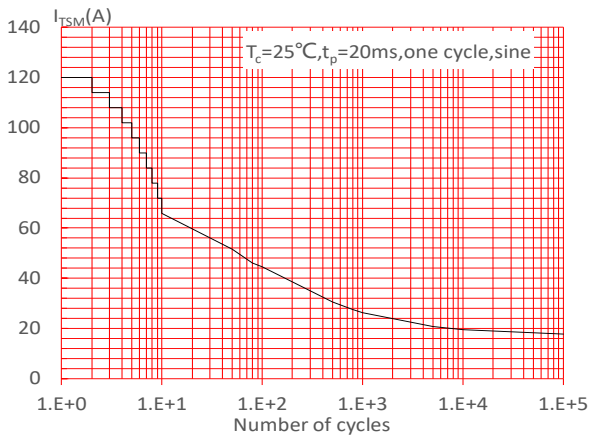
**MARKING**



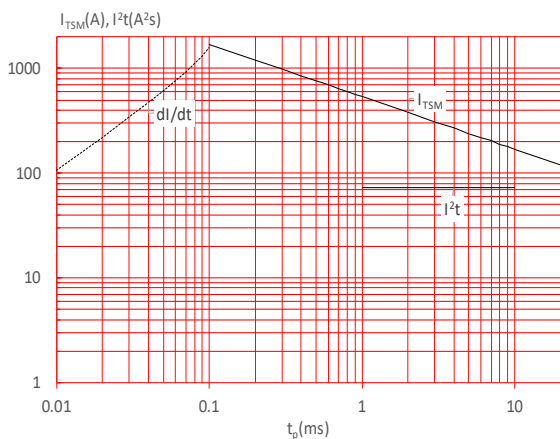
**FIG.1** Maximum power dissipation versus RMS on-state current



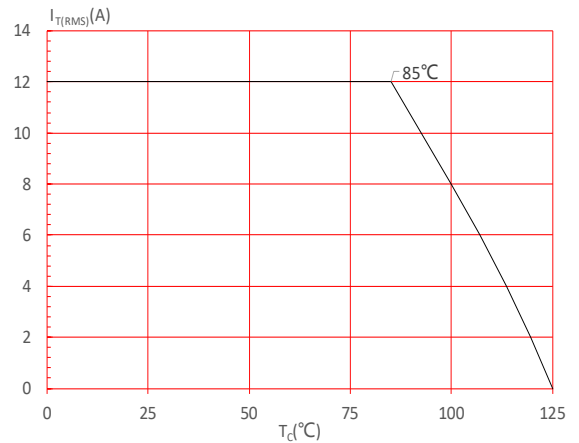
**FIG.3:** Surge peak on-state current versus number of cycles



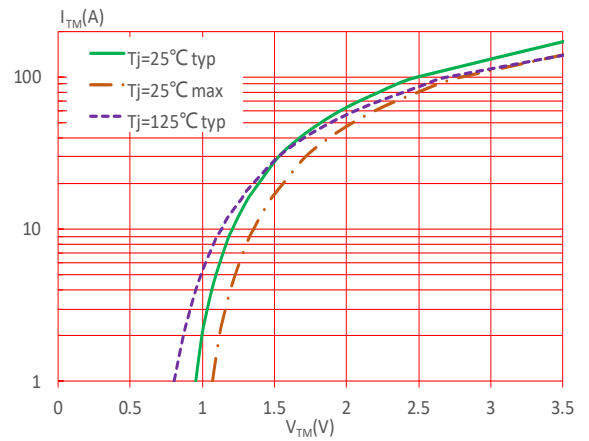
**FIG.5:** Non-repetitive surge peak on-state current for a sinusoidal pulse with width  $t_p < 20\text{ms}$ , and corresponding value of  $I^2t$  ( $di/dt < 100\text{A}/\mu\text{s}$ )



**FIG.2:** RMS on-state current versus case temperature



**FIG.4:** On-state characteristics



**FIG.6:** Relative variations of gate trigger current, holding current and latching current versus junction temperature

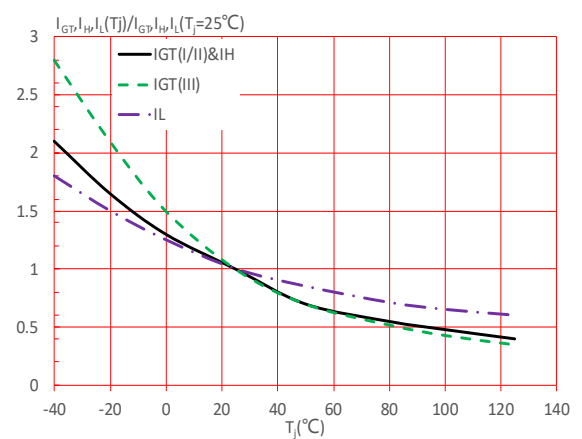
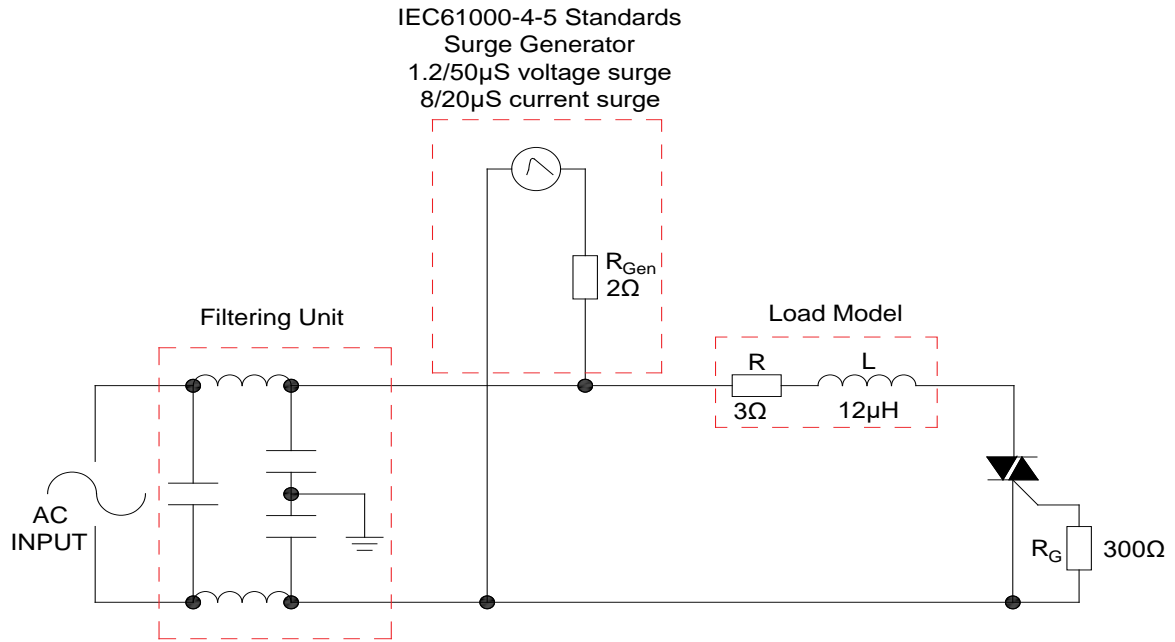


FIG.7: Test circuit for inductive and resistive loads to IEC-61000-4-5 standards



## SHAPING AND SOLDERING PARAMETERS

Refer to 《Instructions for installation of plastic-sealed in-line power devices》 released by JieJie

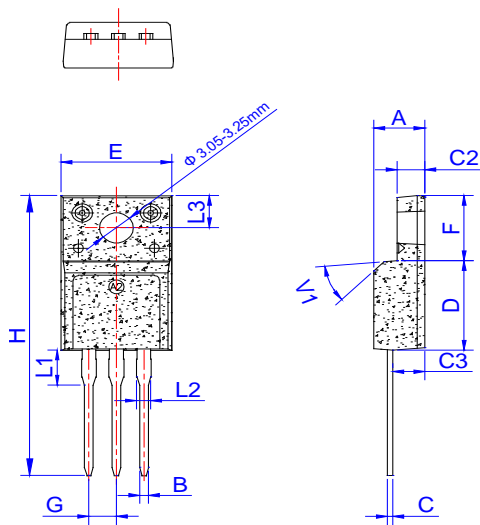
## ORDERING INFORMATION

| Order code   | Voltage<br>$V_{DRM}/V_{RRM}$ (V) | IGT(mA)      | Package      | Base qty.<br>(pcs) | Delivery<br>mode |
|--------------|----------------------------------|--------------|--------------|--------------------|------------------|
|              |                                  | I - II - III |              |                    |                  |
| JST12F-600CW | 600                              | 35           | TO-220F(Ins) | 50                 | Tube             |

## Document Revision History

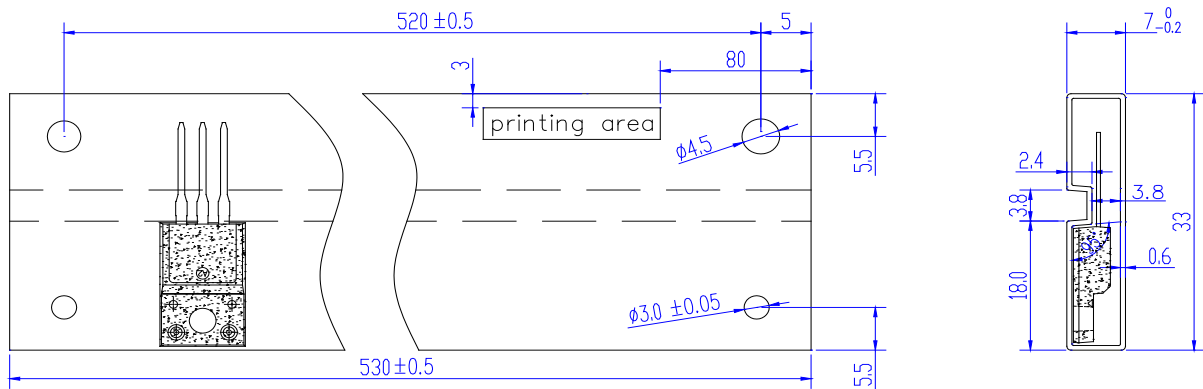
| Date         | Revision | Changes      |
|--------------|----------|--------------|
| Apr.11, 2023 | A.1.0    | Last updated |

PACKAGE MECHANICAL DATA



| Ref. | Dimensions  |      |      |        |       |       |
|------|-------------|------|------|--------|-------|-------|
|      | Millimeters |      |      | Inches |       |       |
|      | Min.        | Typ. | Max. | Min.   | Typ.  | Max.  |
| A    | 4.50        |      | 4.90 | 0.177  |       | 0.193 |
| B    | 0.74        | 0.80 | 0.83 | 0.029  | 0.031 | 0.033 |
| C    | 0.47        |      | 0.65 | 0.019  |       | 0.026 |
| C2   | 2.45        |      | 2.75 | 0.096  |       | 0.108 |
| C3   | 2.60        |      | 3.00 | 0.102  |       | 0.118 |
| D    | 8.80        |      | 9.30 | 0.346  |       | 0.366 |
| E    | 9.80        |      | 10.4 | 0.386  |       | 0.410 |
| F    | 6.40        |      | 6.80 | 0.252  |       | 0.268 |
| G    | 2.40        |      | 2.70 | 0.094  |       | 0.106 |
| H    | 28.0        |      | 29.8 | 1.102  |       | 1.173 |
| L1   | 3.20        |      | 3.80 | 0.126  |       | 0.150 |
| L2   | 1.14        |      | 1.70 | 0.045  |       | 0.067 |
| L3   | 3.20        |      | 3.60 | 0.126  |       | 0.142 |
| V1   |             | 45°  |      |        | 45°   |       |


DELIVERY MODE



| PACKAGE | OUTLINE | TUBE (PCS) | INNER BOX (PCS) | PER CARTON |
|---------|---------|------------|-----------------|------------|
| TO-220F | TUBE    | 50         | 1,000           | 5,000      |

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